

Forestalk

RESOURCE MAGAZINE

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ForestTalk

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An important responsibility of the Ministry of Forests is to provide British Columbians with current information on the management and uses of our forest and range resources, including the social and economic impact that the forest and cattle industries have on the province. ForestTalk is one way the Ministry tries to meet this objective.

ForestTalk also provides a forum for open discussion on all aspects of forest and range use.

Hopefully, readers will make full use of this publication to raise questions and offer comments on our province's forests and range lands.

Tom Waterland

Hon. Tom Waterland, Minister of Forests



Province of
British Columbia Ministry of
Forests



Volume 2 Number 3

The cover photograph is a reconstituted image received from a Landsat satellite, one of two resource analysis satellites orbiting the earth every 103 minutes. These images can be used for a number of purposes, including forest inventory.

The bottom of the picture shows the city of Vancouver and the Fraser Valley. Photo, courtesy of Canada Centre for Remote Sensing, Department of Energy, Mines and Resources.

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Forest Management • Forestry • Forest Industry

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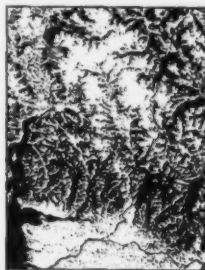
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Spotted Knapweed in Bloom.

BALKAN INVADER

by Richard Thomas Wright

The bumper sticker shown above is quickly gaining in popularity throughout much of the B.C. interior. It highlights a most serious threat to British Columbia rangeland and to the century-old cattle industry of southeastern B.C. The bumper sticker, in effect, is a declaration of war on the rangeland enemy. As the British Columbia Forest Service is the agency charged with managing B.C.'s rangeland, allied with the Ministry of Agriculture, it is in the forefront of the knapweed war.

If the knapweed invasion is not halted, 90 percent of the province's rangeland could be infested by the end of the 1980s. If such a full invasion occurred, it would mean an annual loss in beef production alone of approximately \$29 million.

Knapweed is a native of the Balkans, Russia, and Asia Minor. It was introduced into the province and other areas of Canada and the U.S. in shipments of alfalfa seed from Eurasia prior to the 1930s. Although four species have been introduced — Russian, black, spotted, and diffuse — the latter two cause most of the problem.

Wanted Dead: Knapweed
Reward: RANGE GRASS
 Knapweed Action Committee

Roy

Cranston,

agrologist and

weed specialist with

the Ministry of Agriculture,

and Chairman of the Knapweed

Action Committee says, "Diffuse

knapweed is the worst rangeland

weed in British Columbia, followed

by spotted knapweed. Diffuse has

almost double the seed production of

spotted, it is much more drought tol-

erant, and it can break off at ground

level to tumble. As a result, it is easily

picked up by vehicles, which of

course spread the seeds."

Combined, these highly competi-

tive plants infest over 30,000 hectares

(75,000 acres) of rangeland and

rights-of-way in the southern portion

of the province, insidiously marching

forward like an invading army with

no enemy. The Kootenay-Boundary

country is lost, as is the Okanagan.

The Kamloops region has been invad-

ed, but is fighting a holding ac-

tion.

When knapweed was introduced

into B.C., it left behind its natural

enemies in its countries of origin. No

local animals feed on it, no insects de-

vour it, and there are no diseases to

slow or defeat its growth. Addition-

ally, it is thought by some researchers

that knapweed produces a chemical

allelopathic effect. This effect makes

the soil toxic to other plants, thereby

excluding other species and allowing

knapweed to establish rapidly.



(above) The knapweed in the foreground is taking over this patch of grazing land. If the spread of knapweed is not arrested, the cattle, which do not eat the weed, will be squeezed off the land.

(right) The spraying of knapweed with the herbicide picloram is the only effective control against the weed until researchers can come up with a long term biological solution to stopping its spread.

one foot holding our breath waiting."

Jim McKinnon, of LK Ranches at

Pritchard, sees the problem as being

rather straightforward. When he

bought his property 12 years ago the

plant was present, but not in any great

amount. Like most ranchers, he did

not realize its destructive potential.

Now he must either pay to spray or

lose the land's productive capability

— it is that simple. Three years ago

Jim McKinnon spent \$7,000 to aerial

spray 70 hectares (175 acres) with a

herbicide, and he has since sprayed

small localized areas. The plants are

just beginning to come back. That

\$7,000 has not "improved" his range;

it has simply got rid of some knap-

weed for a while.

At the Chataway Ranch near

Ashcroft, manager Tim Rolph agrees

that having knapweed "is just like

having that acreage out of produc-

tion." At Chataway, the invasion be-

came quite evident four to six years

ago. That was about the time a guest

ranch started trail riding through

knapweed and onto Chataway land,

and when a 100 mile cross-country

motorcycle race was held in the same

area. Now he has over 70 hectares

covered in the useless plant, much of

it along streams and lakes where

spraying is prohibited.

Canada, emphasizes vehicles as being "a very, very important factor in the spread of knapweed. It is my impression that this may be the primary means for its dispersal. We have found a number of places where knapweed is heavy along the roads, but it is moving away from the roads only very slowly."

Wherever a new logging area opens up; when an all-terrain vehicle leaves a knapweed infested road to roar across the hills; when a recreationist pulls off the road and then moves into a new area; when a motorcycle motors down a cow path; knapweed is being spread.

A good example of this seed trans-

port is the Cariboo-Chilcotin. Until

recently, this area was knapweed

free, and for the most part it still is.

But at the Drummond Lake military

reserve west of Williams Lake, a re-

cently discovered population of

knapweed was obviously brought in

by military vehicles from Camp Ver-

non, an area seriously infested with

the weed. Armed forces personnel

now clean all vehicles before they

leave camp in an effort to stop seed

dispersal.

Further west and south in the Chil-

cotin, a very localized outbreak was

found at a Tatlayoko Lake logging

site. Because no plants were located

along the road, it is thought that a

bulldozer carried the seeds to its un-

loading site.

Vehicles are responsible for seed

movement down hydro lines, rail-

ways, highways, and pipelines. Un-

wittingly, florists also contribute to

this problem. They load the dried

weed into pickup trucks and transport

it to the lower mainland for use in

floral displays. This introduces

knapweed seeds to new areas all

along the highways. (The transport of

such noxious weeds is contrary to the

Weed Control Act.)



photography by Richard Thomas Wright

Wanted Dead: Knapweed
Reward: RANGE GRASS
 Knapweed Action Committee

The Forest Service, with the responsibility for spraying on Crown land, doubled its efforts last year by operating four spray crews in the Kamloops region. The emphasis is to prevent the weed from spreading up transportation corridors such as the Cariboo Highway.

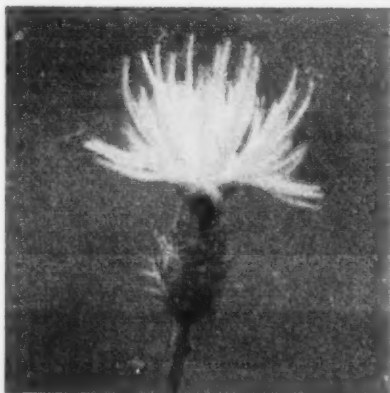
Few people favour spraying herbicides for successive years to control weeds, but at present there is no other solution. *Picloram* is one of the safest and least toxic herbicides available. It has little effect on grasses and has a residual effect lasting three to four years, an important consideration in keeping an area free of new seedlings. It is also approximately eight times less toxic to mammals than the controversial 2,4-D.

Strict regulations govern the use of herbicides. Spraying cannot be done when a wind is blowing, adequate buffer zones must be left around non-target species, and spraying may not be closer than 10 metres to any water source.

Although a number of people have suggested that control of knapweed cannot be achieved unless these buffer zone requirements for spraying are eliminated, these zones are critical to the protection of other plant species and sensitive aquatic ecosystems. In addition, the buffer zones adjacent to water sources protect against the contamination of irrigation water.

But spraying herbicides is not the ultimate solution to the knapweed problem. Massive spray programs are neither environmentally desirable nor economically feasible. The ultimate solution is biological control — the introduction of insects and diseases which will attack knapweed specifically and control its spread.

Research is currently being carried out on insects and diseases which prey upon knapweed in its home territories in Eastern Europe. These are then tested in Canada under rigidly controlled laboratory conditions to ensure that any introduced insects or diseases will not affect native vegetation. Four approved biological control agents (all insects) have already been released in areas where knapweed is at its worst. However, it will take an army of these agents to upset the solid foothold which knapweed has already gained.



(top) Diffuse knapweed, characterized by its white flower, is the most destructive form of knapweed.

(above) The spread of knapweed throughout the B.C. interior is often caused by knapweed seed being transported on the wheels and undercarriages of vehicles. Vehicle owners should check for seeds or plants on their vehicles before leaving knapweed country.

Ultimate biological control of knapweed is at least 10 years down the road. Although the research is costly, over the long run it will be less costly than continued chemical control, which would require funding in perpetuity.

WORKING TOGETHER

An important result of a knapweed symposium held in Kamloops last year has been the hiring of Knapweed Coordinator Bob Drinkwater, a position funded by the Ministry of Forests. At present, Drinkwater is coordinating the activities of over 12 agencies. Knapweed respects no boundaries, and by infesting private and public land indiscriminately it creates many jurisdictional problems. A landowner may have to spray his deeded land with equipment borrowed from the Ministry of Agriculture, have his Crown rangeland

sprayed by the Forest Service, have the land bordering a highway sprayed by the Ministry of Highways, have the area under a hydro line crossing his property sprayed by B.C. Hydro, have bordering municipal lands sprayed by the regional district, and have bordering Indian reserves sprayed by Indian administrations. All of this may be further complicated by test or study plots on some of the lands.

Until Drinkwater's position was created, the many agencies involved in combating knapweed could never be sure if a particular knapweed population spanning various jurisdictions had been sprayed more than once — or not at all.

Bob Drinkwater: "Another aspect of my position is starting new programs. I've been trying to get one started in the East Kootenays, one where the regional district becomes involved. The potential for a knapweed take-over there is very great. In fact, 10 years ago it was well on its way to getting out of hand, until the combined efforts of concerned staff in the Ministries of Forests, Agriculture, and Highways checked it, reducing it to something fairly easy to contain now. We must not relax, though, or we could have the problem develop like it did in the Kootenay-Boundary — possibly the worst area in the province — where there are tens of thousands of acres of nothing but knapweed."

Clearly, chemical containment of knapweed will have to continue until a final biological solution is developed. If not, in ten years time, most rangelands could be seriously infested.

Loss of these lands could not only wipe out the B.C. cattle industry, but it could also mean higher beef prices, a less attractive countryside, and the destruction of valuable wildlife habitat. In fact, a knapweed invasion would affect everyone in B.C. in some way.

For this reason the Knapweed Action Committee is trying to create greater public awareness on the subject and to enlist public support in containing the weed's spread.

The reward for public vigilance will be the preservation of range grass, the cattle industry, and wildlife habitat. As the bumper sticker suggests, everyone can play a part in driving out this Balkan invader. ☐



PUBLIC ENEMY

Spotted knapweed resembles a small Canada thistle, but without the spiny leaves. It is two to 18 decimetres high with a slender stem and numerous branches, each bearing a single head. The leaves vary in width and are deeply segmented. Flowers bloom in July and August with a purple (or occasionally white) bloom. By late August or September the plant has dried, leaving a standing dead plant with the seed head attached.

Diffuse knapweed is a small plant reaching six decimetres in height. It grows rapidly from a small rosette stage in early May, producing one stem with numerous branches and flowers. It, too, blooms in July and August, though the flowers are white (or occasionally purple).

Nutritive value of knapweeds is extremely low, perhaps only 10 per cent of natural forage. Cattle and wildlife will only graze on it as a last resort — due to its extremely bitter taste. As well, the spiny heads of diffuse knapweed could result in damage to an animal's mouth and digestive tract.

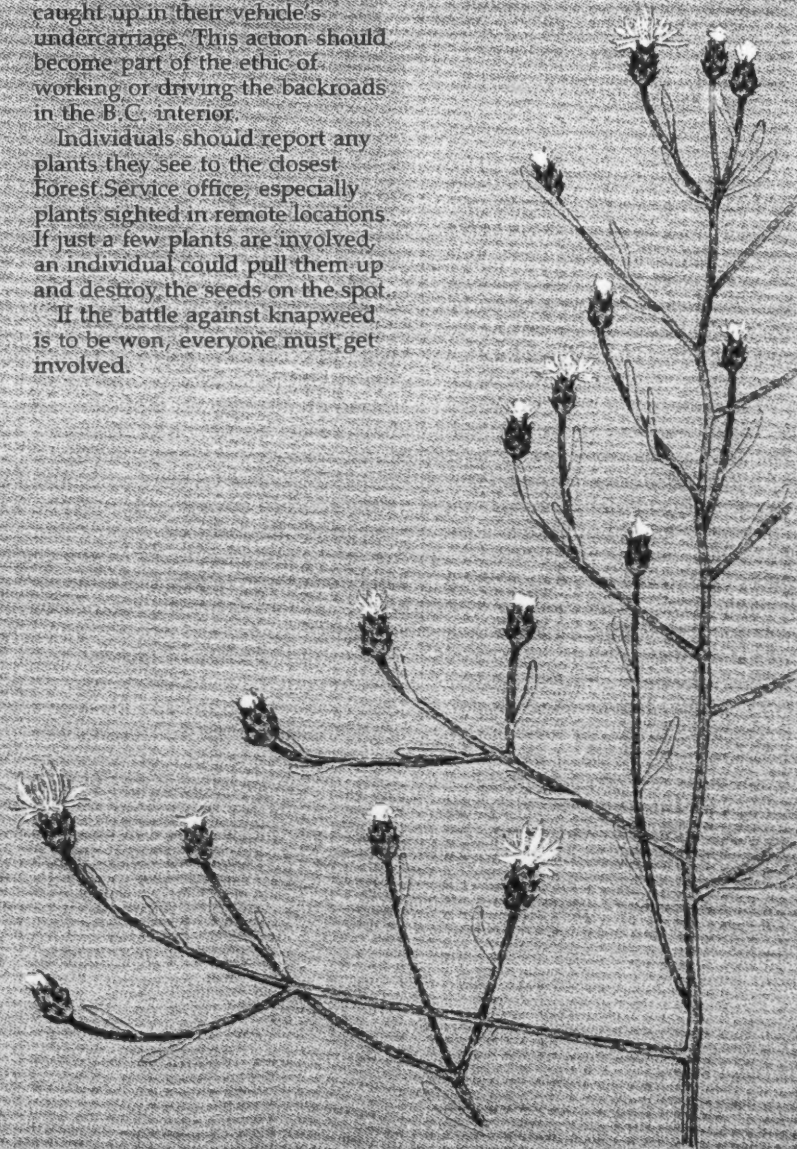
PUBLIC ACTION

Often, resource problems are affected very little by the actions of individuals. But in the case of knapweed, everyone can help.

All resource users, whether they are ranchers, conservation officers, recreationists, or loggers, should learn how to recognize the plant. They should be careful not to drive through any infested area. Drivers, particularly those with recreational vehicles, all-terrain vehicles, or logging equipment, should clean out any plants that might have been caught up in their vehicle's undercarriage. This action should become part of the ethic of working or driving the backroads in the B.C. interior.

Individuals should report any plants they see to the closest Forest Service office, especially plants sighted in remote locations. If just a few plants are involved, an individual could pull them up and destroy the seeds on the spot.

If the battle against knapweed is to be won, everyone must get involved.



*Diffuse knapweed.
Learn to recognize it.*

ForeTalk Interviews

JACK MUNRO

By Jean Sorensen

Often aggressive and always outspoken, 47-year-old Jack Munro heads Regional Council No. 1 of the International Woodworkers of America. Of the IWA's five regions (No. 2 is in Eastern Canada; the other three in the U.S.), No. 1 is the largest, representing over 52,000 union members working in forest products industries from the Lakehead to the Yukon.

Originally from Alberta, Munro joined Kootenay Forest Products in 1959 as a millwright and was elected Vice-President of the IWA Local serving the Kootenays. Nine years later, he moved to the IWA head office in Vancouver as Third Vice-President of the Regional Council, becoming President in 1973. In 1974, and again in 1976, Munro was elected President by acclamation.

The IWA got its start in B.C. in 1937 when it began organizing workers in logging camps, soon moving on to unionize workers in the mills. Today, there are 42,000 members in B.C. alone. Most of these are employed as loggers, shingle makers, and workers in sawmills and plywood factories.

In this interview with *ForeTalk*, Munro speaks candidly about the B.C. forest resource, the forest industry, and the needs of the workers whose standards of living flow directly from the harvesting and processing of timber. Working to improve this standard of living is the IWA's chief objective, and Jack Munro is the union's chief spokesman.



PHOTO: JUDY PETERSON

FORESTALK: How do you feel about the new Forest Act, and how will it affect the IWA?

MUNRO: We've become fairly concerned about what is happening in the forests. We've hired a professional forester on our staff. That's something we've had to do because of the concern our union has. We're concerned that large tracts of timber are being pulled out of available logging lands. We support multiple use — the forests are big enough for everyone.

We think perhaps industry and government have to have another look at reforestation. The life-blood of B.C. depends on our forests. We are attempting to put more pressure on both the provincial and federal governments for more money and better technology. The forests generate between two and three billion dollars a year — and we get a pittance back in the reforestation. Weyerhaeuser spends about \$14 an acre in the U.S. on reforestation; Canada, both federal and provincial governments, spend about 14 cents an acre.

FORESTALK: Doesn't the Forest Act call for better reforestation methods?

MUNRO: There are some parts of the Forest Act we support and others

we are pretty concerned about. I think that the Forest Act doesn't clearly say to the majors in this industry, "Either you spruce up your performance or we're going to do something about it."

They say that it does, but the telling point of the Forest Act is certainly going to be the regulations, and they are not out yet. This is the difficulty in debating the legislation when we haven't seen the regulations.

"I think that the Forest Act doesn't clearly say to the majors in this industry, 'either you spruce up your performance or we're going to do something about it'."

If government continues to own the trees — and I support the idea — then, they are the landlord. Government should be doing a lot more in reforestation. If we, the people, own the trees, and if we say it's all right for someone to cut them down, then, we, the people, should get enough out of that to put more trees back in there.

FORESTALK: Why government and not industry?

MUNRO: The government owns the trees.

FORESTALK: Are you against companies reforesting?

MUNRO: That depends... You can get into Public Sustained Yield Units (PSYUs) and Tree Farm Licences (TFLs). On TFLs, certainly the companies should be responsible. The Forest Act says that on TFLs, if you are a good company and you harvest properly, we extend your tenure. Now, we don't know how effective that will be — it depends on the regulations.

"You can't have a viable sawmilling industry without an adequate log supply."

FORESTALK: What sort of work has your in-house forester been doing?

MUNRO: He's been very involved in analyzing the Forest Act, and with our submissions to the Minister of Forests on the new act. He's been involved in the Tsitika-Schoen on northern Vancouver Island, an example where there was a stop to all logging.

FORESTALK: What were your findings?

MUNRO: Basically, we said there is a lot of wood in there that can be logged, and there is still room for parks and recreational areas. It's one area where, if logging methods cause too much silting in rivers, we change the methods to prevent that. Like I say, you just can't pull a large chunk of land out of timber production.

FORESTALK: Generally, you're looking for better reforestation and more land to log?

MUNRO: You can't have a viable sawmilling industry without an adequate log supply. The East and West Kootenays are examples of where there are mills which thought they had enough wood to last for a long time. All of a sudden someone says: "No, you can't log here anymore. We're going to set this area aside for a recreational area." Our position is, if things are done properly, there is enough for everyone.

FORESTALK: You mentioned, at a forest industry meeting, the IWA's strike record?

MUNRO: What I said was that the people in this industry should stop saying that they are plagued with strikes, because it isn't true. The IWA on the coast of B.C. has had one four-week strike since 1959. (We've had a lot of wildcats, which are walk-outs.)

Industry has stopped saying that now. I don't know if they were trying to impress the public that we were irresponsible or something. But it was having the reverse effect.



PHOTO: JUDY PETERSON

FORESTALK: Didn't it result in problems with the U.S. markets?

MUNRO: Not only the U.S., but the off-shore markets. Customers were saying: "Why should we rely on B.C. for our lumber if we can't be sure of delivery dates?"

I just returned from a trip to Japan. One thing that bothered me a bit was the Canadian ambassador mentioning our strike record. I pointed out to him that what he said may have been true several years ago, but it certainly was not true now. The loss of man days in B.C. has improved about 80 per cent within the last couple of years. That might not continue, though.

"What is happening right now proves once and for all that the union movement is not responsible for the rise in the cost of living."

FORESTALK: What makes you say that?

MUNRO: The trade union movement has argued very strenuously with the federal government in the establishing of an Anti-Inflation Board. Every country that has established controls on one sector of its society — the worker — has found it

did not work. For the last three years, the trade union movement has been accepting settlements of between four and six per cent, but it is still blamed for the rise in the cost of living. What is happening right now proves once and for all that the union movement is not responsible for the rise in the cost of living. No one can expect working people to continuously fall behind at the rate of four or five per cent a year.

"We are not going to have our standard of living eroded."

FORESTALK: When the controls come off and you go back to the bargaining table, do you see yourselves asking for a substantial increase to catch up with the cost of living?

MUNRO: To say the very least — we are not going to have our standard of living eroded. The standard of living should improve each year, not be eroded. Unless some things turn around very, very quickly, I visualize extremely difficult negotiations.

FORESTALK: You were in Ottawa recently?

MUNRO: Yes, I'm part of a three-man commission. We have an employer's representative, myself representing the trade union movement, and a chairman. The commission is inquiring into redundancies and layoffs. We are just getting started, and are going to have hearings across Canada in August and September, hopefully to come up with a good code of ethics.

FORESTALK: Is there a decent way to lay someone off?

MUNRO: Well, there are all types of things that we have opinions about. It's wrong — all of a sudden — to shut down a plant and say, "Tough beans! You've worked here 25 years, but on Monday you don't have a job anymore." That is unacceptable.

FORESTALK: You're looking at situations where the industry closes down and leaves a town behind?

MUNRO: Right, the responsibility of the employer.

FORESTALK: Is there a responsibility of the employer past, say, the life of a mine?

MUNRO: A mine is probably more difficult to talk about. A mine at some point runs out of ore. But,

there are all kinds of other examples where they've shut down plants because they can produce, or get the product cheaper, in another country. The trade union's position is that this is unacceptable.

FORESTALK: Is it difficult to thrash out problems with industry?

MUNRO: There are a lot of things that I guess we never will agree on. But the industry and our union meet almost constantly about problems that come up. We resolve a lot of problems during the life of an agreement. Perhaps the talks are not as successful as we would like them to be, but still we resolve a lot of problems.

FORESTALK: What do you basically want from industry and government?

MUNRO: Wages are certainly an important part of it. But with the ridiculous income tax that we have to pay now, we are looking at other benefits that aren't directly taxable. As far as loggers are concerned, trees are getting further up the mountain, and I think industry has to understand we are getting pretty serious about a guaranteed annual income.

From government, I think everyone wants leadership. We've argued with the federal government, for I don't know how long, that interest on mortgage payments should be deducted from income tax. We have the wood, the people to manufacture it, and people to build homes, but it is becoming virtually impossible for a working family to own a home.

"In this free and democratic land, employers are still as cheap and as tight as they are in any other part of the world."

FORESTALK: Is there an indication that unions are becoming less popular today?

MUNRO: No. I think unions are popular, but the press doesn't report it that way. The people left to organize are the old, hard line employers who make it pretty difficult. Someone starts to organize and they get fired. Although the labour code says you can't do this, it happens.

The benefits that the worker enjoys today is because of the trade union movement. In this free and democratic land, employers are still

as cheap and as tight as they are in any other part of the world. The trade union movement has been able to extract something out of them.

FORESTALK: During the nearly 20 years that you have been involved in the IWA, what do you see as the most significant change in the standard of living?

MUNRO: The biggest single thing we have done is, instead of relying on the government — which the union did for a long time — to provide adequate pensions, we developed our own pension plan. It's a



PHOTO JUDY PETERSON

pension plan where the members can move from company to company without fear of losing any of their benefits. They can move anywhere in Western Canada ... and remain in the pension plan. Outside of the Canada and Quebec pension plans, ours is the most portable in the country.

FORESTALK: We've heard the complaint that unions, government, and industry are getting too big. Is this the only means of negotiating today?

MUNRO: It is a fact of life that where you have fewer unions, there is more labour stability. This country has far too many unions in my opinion.

FORESTALK: Do you expect to get larger?

MUNRO: Yes, we'll get bigger.

FORESTALK: How many more members can you pick up in the western region right now that are not organized?

MUNRO: I would be just guessing, but I think there are still 20,000 people running around.

FORESTALK: Is it easier to organize older individuals who have been through the 1930s, and does that 20,000 represent younger people who tend to be more independent today?

MUNRO: I don't think you have to have gone through the Depression to understand the value of a trade union. I am 47 years old, which I don't think is very old. When I look around a convention floor, there are a lot of young people out there. The younger people certainly may have different values than we had. But some are pretty good values — things that maybe we just didn't think of. It's a changing world.

"Our membership has some of the best environmentalists that exist. They choose to work outside and they don't want to see it destroyed."

FORESTALK: How does an IWA member relate to environmental issues while on the job in the bush?

MUNRO: Our membership has some of the best environmentalists that exist. They choose to work outside and they don't want to see it destroyed. However, we have to be careful that it doesn't go too far. There is absolutely no sense at all in turning B.C. into a fantastically big, beautiful park with no employment.

FORESTALK: What about the image of the logger coming in with a bulldozer?

MUNRO: That image shouldn't exist anymore. Roads are carefully planned for the least amount of disruption, and bridges are carefully built with longer spans so that we don't destroy the streams.

FORESTALK: But, what is the position of the individual worker when it comes to environmental issues?

MUNRO: Just your own conscience. Our people are not interested in destroying creek beds or spawning grounds. One thing that really bothers me is that we still see pictures of creek beds with trees in them. Those trees are blow-downs or are there from causes of nature. Our people don't fell trees into creeks.

Our people live in smaller communities, they work outside. On days off they go fishing or hunting. As a matter of fact, they probably get pretty disturbed when a bunch of people from "the bright lights" come into a remote area and don't understand what it's like to be in the bush. **Q**



TAKING INVENTORY

From Saddles to Satellites

by Grant Ellis

There are 52 million hectares (130 million acres) of forest land in British Columbia, but how many of these contain mature timber? What is the growth rate of immature timber? How healthy are the forests?

To try to answer these and countless other questions about the B.C. forest resource, the Forest Service has spent over 60 years developing progressively more detailed and accurate forest inventory procedures. Today, with the assistance of space-age technology, the Ministry of Forests' Inventory Division is in the process of mapping and cataloguing B.C.'s forests with greater precision than ever before.

■ HOW IT GOT STARTED

The first years of this century saw a swift rise of lumber prices in eastern North America. This resulted in a sudden demand for the less expensive B.C. timber. However, no one really knew how much timber the province had to sell. Cutting permits were

often handed over reluctantly, after very rough inventory guesswork.

In 1910 the Fulton Royal Commission, appalled at this lack of reliable information, recommended a province-wide timber inventory. The result was the Forest Act of 1912 and the first serious attempts to measure the forest resource. It was a full 25 years before the job was done.

The newly formed Forest Service went to work on its assignment with great enthusiasm. Surveyors were dispatched by boat and rail, on foot and on horseback. They talked with travellers, trappers, prospectors, and Indians. In time, their drawings and estimates were labouriously converted to maps and added to the inventory, slowly replacing what Fulton had called the "wildest of guesswork" with their own better-educated guesses. But the years were slipping by.

In the 1930s it became obvious to Gerry Andrews, a surveyor, that no survey of any useful accuracy or timeliness could ever be wholly accomplished by men on the ground. So he

This picture of the northwest tip of B.C. was taken from a Landsat satellite. It shows the ochre-coloured Alsek River draining into the black Pacific at Dry Bay, Alaska. The bright areas are glacial ice and snow. Landsat photos are also used to show major changes in forest cover.

(below) When it became evident in the early part of this century that a complete inventory of B.C.'s forests was required, men went out on horseback to get the job done. Pictured here is Forest Ranger McVie crossing Nemata Creek in the Cariboo area in 1911.



went off to Europe to investigate a new development called "photogrammetry," where aerial photos taken from shaky biplanes were being used to map inaccessible terrain. Andrews, along with Lyle Trorey and Bill Hall, then went on to pioneer photogrammetry work in B.C. By 1937, owing much to the farsightedness of these three men, the province's first forest inventory was finally completed.

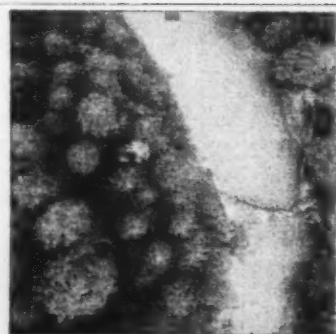
Today, aerial photography still forms an important part of forest inventory procedures. Taking the pictures is now the responsibility of the Ministry of Environment's Survey and Mapping Branch. The Inventory Division makes use of these photographs for its own purposes. Each flight is planned up to two years in advance, but it is still dependent on weather (cloudless days are needed) and seasons (the long shadows occurring early and late in the year make photo interpretation difficult). Some cloud-bound coastal areas have defied aerial photography for five years.

Interpretations of aerial photos is a difficult and inexact science, but the difficulties are lessened by the use of "ground truth." This is a close-up investigation of a sample site within the photographed area. Inventory Division field crews from Victoria make the investigation by four-wheel-drive, helicopter, boat, and — in the tradition of the 1912 survey — on foot. They may tell trees, bring in biological samples, or measure a specific area and run a count. This serves to put aerial photo interpretation on a firmer basis.

One special technique has brought aerial photography as close to the ground as it can get — about 150 metres. A specially fitted helicopter holds a tube lengthwise beneath it. In the tube are a pair of cameras which take stereo photographs. Viewing a pair of these matched transparencies, a technician can plot the height and position of individual trees for research or inventory purposes.

■ ■ GETTING UP TO DATE

By the middle of this century, as demands on the forest resource continued to escalate, the need for more specific information to aid forest planning became apparent. The Inventory Division, which had become a separate entity in 1949, responded in

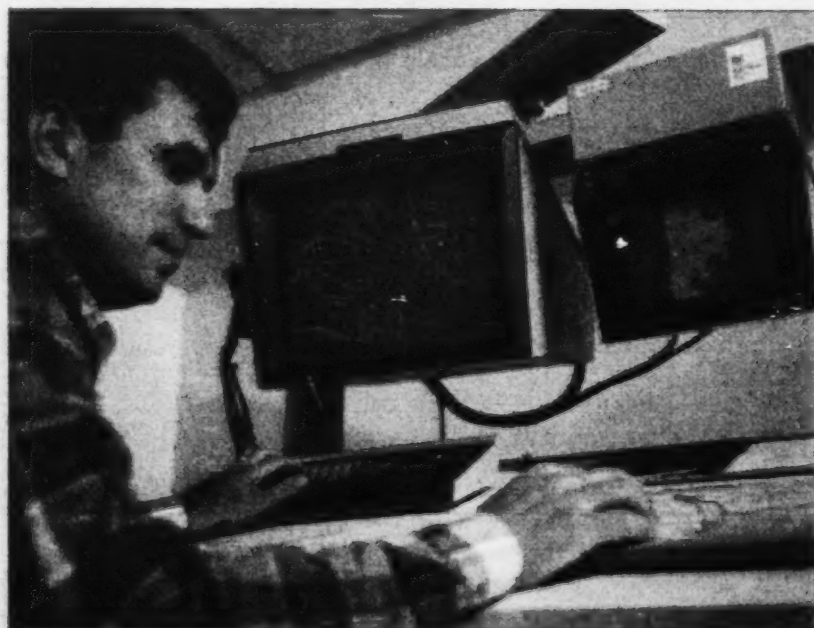
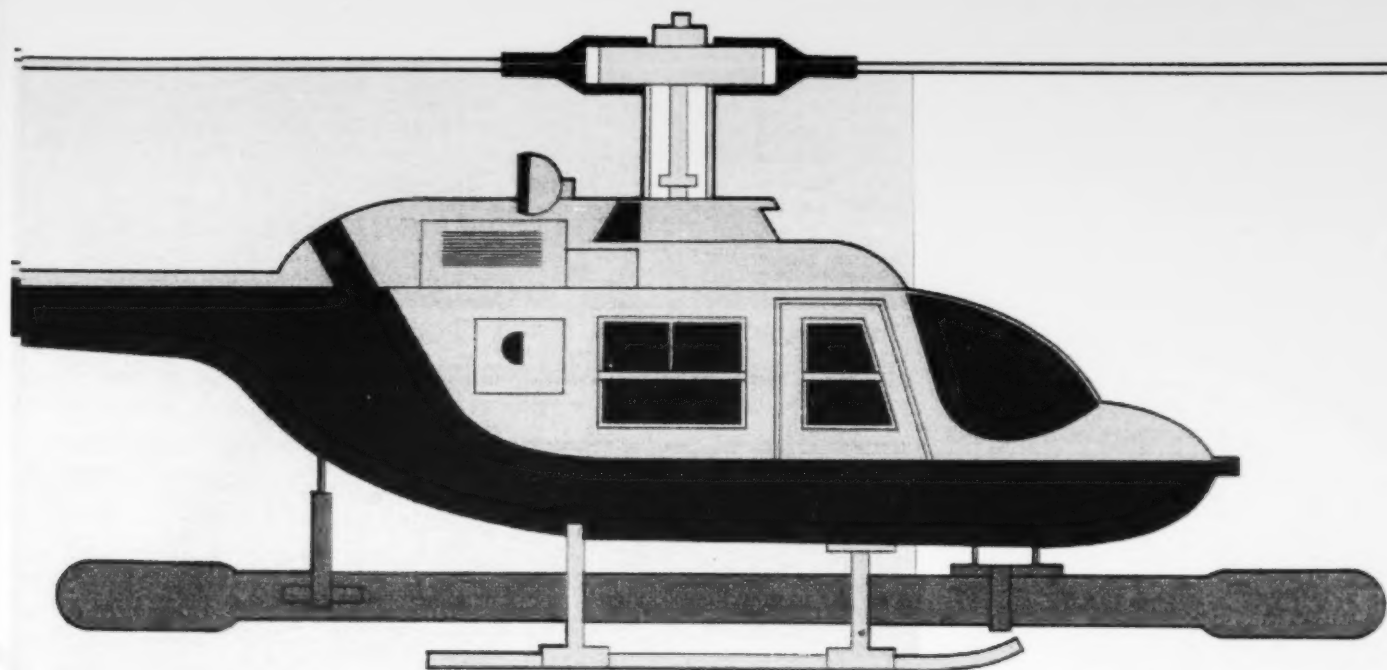


The pair of stereo photographs reproduced here can appear as a single, three dimensional image to the naked eye, but it may take a little practice.

Hold the open magazine rigidly with both hands, bringing it towards your face until your nose touches the dot between the two photos. Slowly, move the magazine away from your body, being sure to keep your left eye focused on the centre of the left-hand photo and your right eye focused on the centre of the right-hand photo. Move the magazine in and away from your body until the single, three dimensional image appears.

The introduction of aerial photography — photogrammetry — was a great asset to forest inventory procedures. Working from shaky biplanes, inventory crews could cover larger areas of land at one time. More recently, a helicopter was specially designed with a tube carrying a pair of cameras which take paired stereo photos. When these are seen through a special viewer a three dimensional image emerges, allowing a technician to plot the height and position of individual trees.

All forest inventory maps are now stored in a computer-based unit called an Interactive Graphics Design System. The IGDS can instantly display inventory maps of an acre of forest, or the whole province at once.



1961 with a new, more detailed approach to surveying the forests. This Class B Unit Survey, as it is called, was completed in 1975.

All 47 million hectares of Crown-managed forest land have been recorded on 7,320 master maps. Each map is subdivided into about 500 irregularly-shaped areas (polygons), each outlining a forest type. For each polygon, 32 attributes describe the forest by age, height, type, volume, site, climate, and so on. Field crews have taken 56,000 sample checks since 1953.

Recently, field crews have been identifying Environmental Protection Areas (EPA). These are areas where full-scale logging activities might unduly affect soil, water, fish, wildlife, recreation, or forest regeneration. Timber harvesting and forest management practices are then modified according to an Environmental Protection Area's degree of environmental sensitivity.

However, the need for more kinds of information keeps growing, and although current information is stored in a computer, the filing and retrieval of the data are cumbersome processes. You must ask just the right question. The problem is not one of people, but of technology. There must be a faster way to get information, to get it into the system, and to get it out when needed. To help solve this problem the Division looked to the world of space-age technology.

■ MEMORY MAPS AND METRICATION

This past June, after weeks of testing, the Inventory Division put into effect its new Interactive Graphics Design System. IGDS was conceived and built in Huntsville, Alabama, by a team formerly associated with NASA space programs. Basically IGDS is a computer-based system that processes and displays information.

All kinds of information can be fed into IGDS — statistics, equations, measurements, boundaries, names, even drawings and maps. All 7,320 maps of the Class B Unit Survey, and the thousands of polygons they include, will be stored in the form of computer data. And new information can be introduced at any time.

The IGDS gives back its information on a video screen in response to questions fed through a typewriter-style keyboard. For example: "How many islands within certain latitudes and longitudes contain at least 20 per cent Douglas-fir and 40 per cent hemlock over 120 years old?"

The system responds by means of an ingenious follow-the-bouncing-ball approach, indicating what button to push. Then it draws the answer. Yellow lines rapidly trace the map and various overlays upon the video screen. Press another button and a printed version of the display appears in seconds. The screen can display an acre of forests or the whole province at once.

The IGDS provides greater speed, accuracy, and convenience. Metrication, for example, could have cost thousands of tedious man-hours; now a computer program automatically converts maps and statistics to metric when they are called for.

But despite this technology, a difficult question remains. IGDS is working with data up to 10 years old. Where — at a manageable cost — can foresters get the current data they need?

Part of the answer lies in getting more complete information on the ground. Ranger districts keep local records of changes in the forest cover, especially newly logged areas, and the Ministry's Reforestation and Protection Divisions record the rate of forest regeneration and catalogue forest lands affected by fire, insects, and disease. Also, the Inventory Division is beginning to employ differ-

ent ground sampling techniques which produce more reliable results more quickly.

But there is another possible source for up-to-date inventory information — 565 miles away and straight up.

■ LANDSAT

First launched by NASA in 1972, Landsat consists of two satellites dedicated to earth resources management. It has monitored world wheat

crops, corn in Indiana, and orchards in Washington. From urban pollution to the spread of noxious range weeds in Oregon, from fouled estuaries in New England to lost Mediterranean treasure, Landsat is being used to watch them all. The Inventory Division is now experimenting to see if Landsat's global perspective can help improve B.C.'s forest inventory.

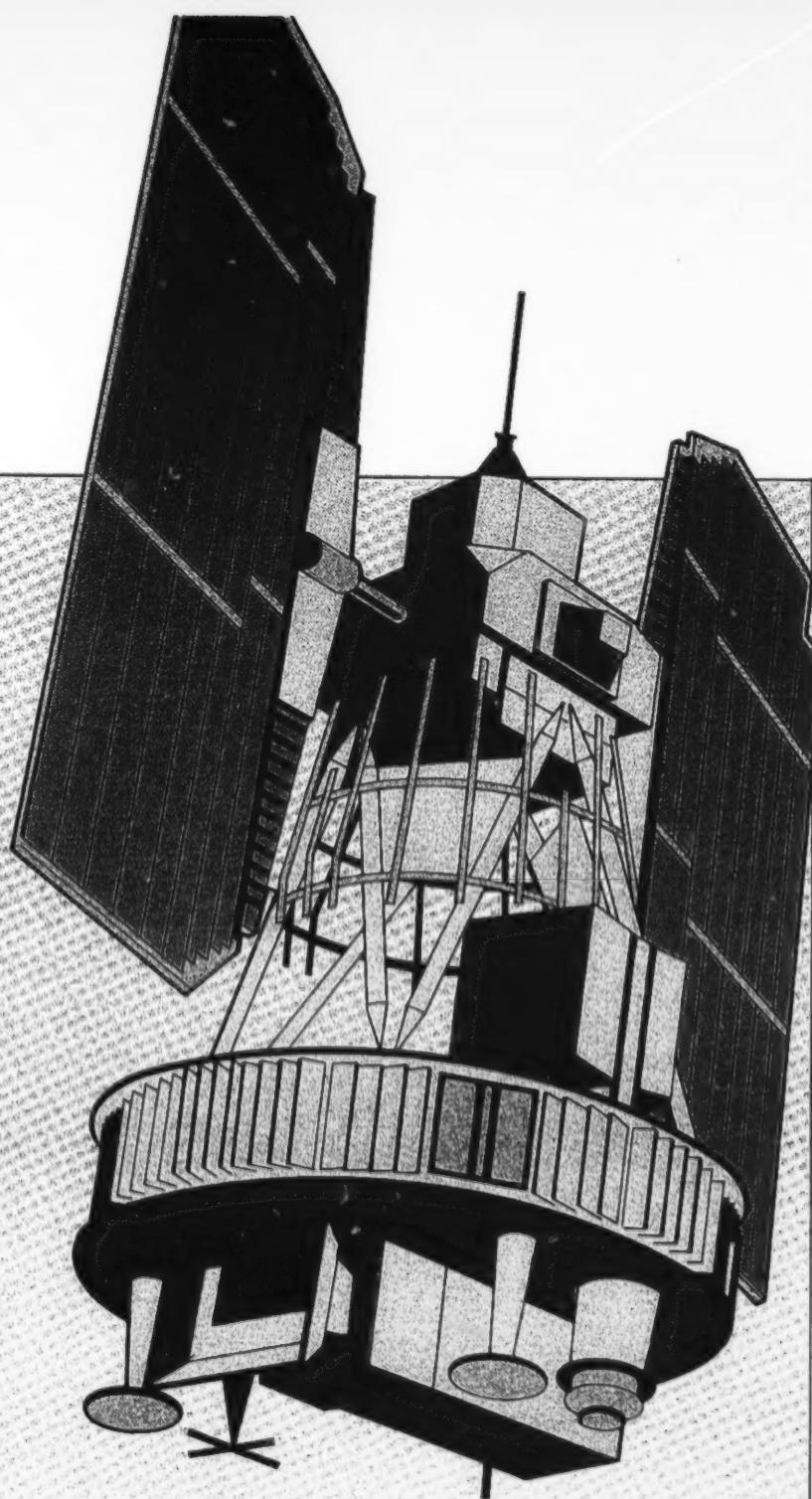
Each Landsat satellite circles the globe every 103 minutes, returning to exactly the same spot at exactly the same time every 18 days. Major

(right) The red patches in this Landsat photo of the Clearwater area in the southern interior indicate forest areas that have been clear-cut.

(opposite page) A Landsat satellite, one of two orbiting the earth every 103 minutes and returning to exactly the same spot at exactly the same time every 18 days. The signals they send back can be reconstituted into photographs providing information on anything from undersea treasure to the latest changes in the composition of B.C.'s forests.

(below) This NASA photograph of the earth was taken during the first moon walk.





changes on the earth's surface can easily be seen in the Landsat pictures, which are transmitted to earth stations and recorded on magnetic tape. The Inventory Division will investigate both the usefulness of buying tapes which refer to B.C.'s forest land and the feasibility of playing that information through IGDS.

The black and white satellite photographs can be reconstituted from the tapes into complete pictures and printed. By assigning false colours to the images, healthy trees will appear typically as bright red; blighted ones, green. Clear water will show black, but sediment turns the image an ochre orange.

Landsat can resolve images as small as 61 metres by 61 metres (200 feet by 200 feet), which is hardly good enough to tell a spruce from a cedar. But then, Landsat's job is to show changes in masses of trees, especially changes from logging and fire. High quality aerial photography can then come in for the details. If Landsat's overview proves to be a useful supplement to current inventory procedures and ranger mapping, it could become a regular part of the inventory process.

■ A QUICK LOOK AHEAD

It will take approximately three years' work at two shifts a day for the Division to convert its existing inventory data to the IGDS computer system. Eventually, a forester at a regional office should be able to sit down at a terminal in his own building and ask it difficult questions, which it will answer promptly and thoroughly.

The big saving from using this new technology will be one of time, and once the system is up and running, its costs of maintenance and operation should be far lower than the previous system. But the greatest payoff will be in getting reasonably current information into the hands of decision-makers promptly. And there is no way to measure the benefit there.

IGDS, along with the potential usefulness of Landsat, will not solve every problem associated with forest inventory; nor will IGDS and Landsat eliminate arduous field work, replace aerial photography, or solve ecological problems. But the two offsprings of the space-age promise to be a giant step towards increasing our knowledge of British Columbia's most important resource. ■

THE ROTTING LOG

A photo essay by
Gary and Judy Green

A tree releases its hold on life and comes crashing down. In time, the hulk of wood fibre slowly returns to the soil from which it grew.

At first, the log becomes host to a variety of forest janitors — shallow boring grubs, then beetle larvae and termites. Tunnels riddle the wood, allowing water to seep through. Fungi begin to take hold, breaking down the wood into simpler substances. Bacteria break it down even more.

Next come the mushrooms, another reducing agent. They convert the dead protoplasm into simpler chemicals. Mushrooms also attract organisms such as snails and slugs, which feed on their rich contents.

Eventually, the log is broken down into a paste in which bacteria, wireworms, and fungus beetles thrive. Woodpeckers, black bears, and other predators break apart the decaying log in search of these delicious grubs. Finally, millipedes, earthworms, and pillbugs move in from the soil to complete the clean-up operation.

During the decomposition process, raccoons, mice, squirrels, and mink may take up residence in the hollow log. Birds will seek out cracks in which to construct their nests.

A rotting log is more than just litter on the forest floor. Here, the forces that renew life are constantly at work.



△ A burrowing termite.



△ A Pacific tree frog.





△ Seedlings find a rotting log to be an ideal nursery.



▽ Angel wings mushrooms

▽ A black bear.



▽ A banana slug feeding on a rotten log.







Prince George Grows on trees

by Bryan McGill

photography by Ross Mason

If there is a coming city in B.C., it has to be Prince George, referred to these days as "The Spruce Capital of the world." Almost overnight it has become a major centre for the export of lumber and pulp to world markets, and B.C.'s fastest growing city shows no signs of slowing down.

Prior to the 1960s, as in the province's other forest districts, there was a tremendous waste of wood in Prince George. In fact, as much as 75 per cent of available timber was not being utilized. This wood was either left in the forests or consumed in the burners of planer mills and sawmills.

Fifteen years ago, the awareness of this wastage prompted the establishment of a pulp industry in Prince George, based on the unheard-of concept of converting scrapwood into pulp chips. The practice at that time was for pulp mills to make chips directly from logs.

Three pulp mills were constructed almost simultaneously. These were the sister companies of Prince George Pulp and Paper Ltd. and Intercontinental Pulp Company Ltd., and Northwood Pulp and Timber Ltd. Prince George was suddenly the most pulp intensive centre in the world.

So successful was the idea of using

sawmill residues that today, even with three big mills producing 625,000 tons of bleached kraft pulp annually (plus 108,000 tons of kraft paper by P.G. Pulp and Paper) there is a huge pulpwood chip surplus. This has led to talk of building yet another mill or at least expanding the capabilities of the present ones.

But the pulp mills are only one part of the Prince George success story. Their establishment and the push for closer utilization of wood led to significant changes in logging and to a far-reaching upgrading and consolidation of the sawmill industry.

The history of this industry in the Prince George area dates back to the time between World War II and the 1960s, when hundreds of small bush sawmills started producing rough lumber for planer mills in the city. "A six-man sawmill operation was then considered a big operation," recalls Forest Ranger George Meents, who, before he entered the Forest Service in 1945, was himself a logger. "You would find two-man operations that used crosscut saws and horses."

At that time, too, mainly spruce with 12-inch tops were being logged. Smaller trees and other species were generally ignored. "Stands of pine were considered to be weeds," as one logging executive put it. "There was just a tremendous amount of wasted wood left in the forests."

In less than three decades Prince George has blossomed from a frontier community into a world centre for pulp and lumber production. The city is shaped by the trees around it.

Of the nine major lumber-producing regions in North America, Prince George ranks second only to Alabama in being the most economic and efficient.

Today, these pine stands are an important part of Prince George's timber harvest. With the new demand for chips, smaller trees have become valuable. Trees with four-inch tops are now logged as a matter of routine.

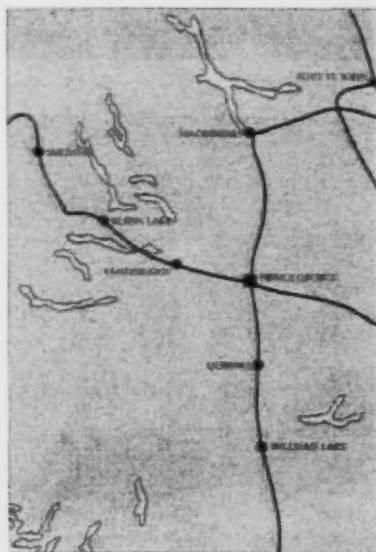
The big Prince George sawmill operations that replaced the small bush operations introduced barkers and chippers for chipwood. They also began to transform their sawing technology further so that they could turn even small trees into lumber.

Van Scofield, Manager of the Council of Forest Industries (COFI) in the northern interior, explains that the trend in sawmills today is "to get away from the old, circular scrag saw, which has a very heavy kerf and is not particularly accurate, into the high-strain band saw, which reduces a lot of waste."

Sawmills are becoming more sophisticated in their control systems, which means fewer mistakes are being made in manufacturing the length of logs. Automatic lumber sorters have been introduced, replacing the green chains which were once a source of ready, if back-breaking, employment for unskilled workers.

This new sawmill technology is being used partly to keep down labour costs so that lumber prices will continue to be competitive in the world market. "All sawmills here will have automatic sorting equipment in a short time," says Iun Rustad of Rustad Brothers and Company Ltd., a sawmill which started out as a planer mill in 1947 and now employs 195 workers. "I don't think you can be competitive and not have this sort of equipment."

Though there will be fewer unskilled jobs, there will be more call for tradespeople to look after the computerized equipment being installed in the mills, reports John Whitner, Vice-President of Netherlands Overseas Mills Ltd. "As the years go by we are going to have a work force which is going to be a lot more educated and better trained than we have had in the past."



Just one modern sawmill can now produce as much lumber as 800 small bush mills could 20 years ago. And every year production increases significantly. Scofield cited regional sawmill production as 2.1 billion board feet in 1972 and 3.6 billion in 1977 — about a 50 per cent increase.

Generally regarded as the two most modern sawmills in the Prince George area are provincially-run Plateau Mills, and Carrier Lumber. According to Scofield, "Plateau Mills is the best example of the developing edge of sawmilling in B.C. It is the most advanced mill in the north central interior." Bill Kordyban, President of Carrier, has either modified conventional equipment in his mill or has come up with completely new designs to increase productivity. Kordyban is such an expert innovator he is used as a consultant by other mills.

In summary, Prince George has in 10 years time become a leader in sawmill technology. It is selling lumber all over the world, much of which is from wood once considered to be useless. Of the nine major lumber-producing regions in North America, Prince George ranks second only to Alabama in being the most economic and efficient, and that is only because Alabama has cheaper labour.

"The sawmills in north central B.C. are the best in the world," notes Bill Young, Assistant Deputy Minister of Forests.

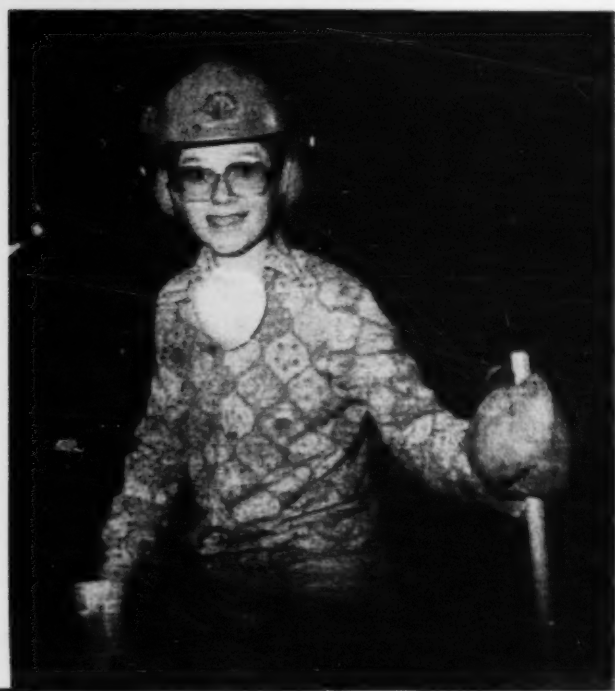
The changes in the forest industry have had a profound impact on life in Prince George. The pulp mills and the new sawmills created a boom town in the 1960s, and with it a lot of birth pains and stress. However, there was a stabilizing factor in all this that began to foster a family life-style of living. This was due largely to the fact that the sawmill community moved into town and that workers were five minutes away from home, rather than out in the bush for days and weeks at a time. As sawmill operations became centralized in Prince George, better-built logging roads were created and existing ones improved. Today, most loggers commute daily from their homes in Prince George to the logging sites where they lived before for months at a time.

The physical conditions of life in the city have also improved: the air over Prince George is generally much cleaner than before. Up to the 1960s rough lumber was trucked from the bush mills into Prince George for dressing in planer mills. These mills disposed of their sawdust in burners, which belched smoke and a lot of half-burned sawdust into the air. The planer mills are now gone and residents no longer sweep singed sawdust off their cars when they get up in the morning. Sawdust fallout has been replaced by the sulphurous odour emanating from the pulp mills. But the prevailing wind usually blows the smell away from the city. Residents say they are only bothered by it when an inversion happens.

As for the future of the forest industry, most executives from industry interviewed by ForestTalk expressed optimism and welcomed the new Forest Act as a potential factor in guaranteeing better planned and managed forests.

"The sooner they get the Act into

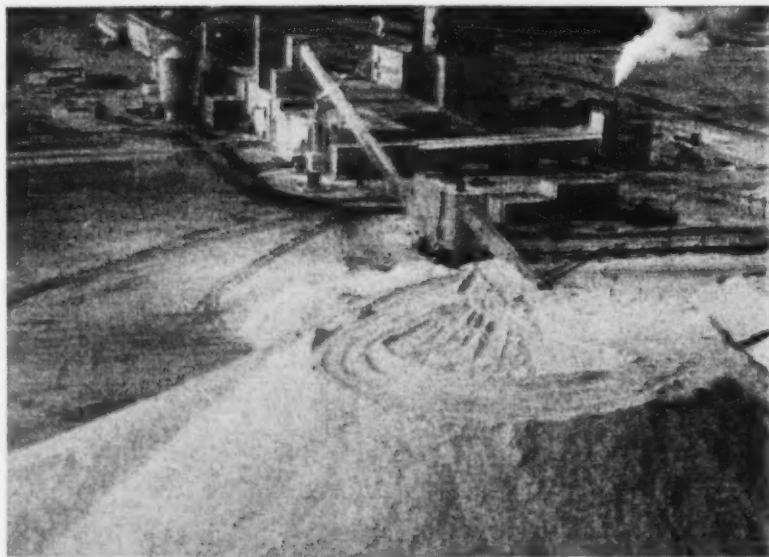
Computerized operations in the Netherlands sawmill allow for more efficient cutting and sorting of lumber — and smiling faces.



place, the better," says Jim Rustad of Rustad Brothers. I think the legislation is good, but we still have to see the regulations."

"We've had our ups and downs with the market," says John Whitmer of Netherlands Overseas Ltd. "That has been a factor and will always be a factor. But I think, as a whole, because we are on a sustained yield basis, we should go on forever."

Whitmer sees more secondary industry coming to the fore at Prince George. In due time, a particle board plant and a chipboard plant will be built in Prince George, he predicted. He says, "With the allowable cut we have in the Prince George area, there is a lot of room for expansion. We don't have to cut more wood. We can produce more products."



Sprucing up its image

by Bryan McGill

"Prince George throbs," remarks Mayor Harold Moffat, sitting in his office in a bustling city hall that is tucked within the shadow of Connaught Hill, a major landmark overlooking the city's core. Moffat, a blunt-talking hardware dealer who has been mayor for eight years, has no doubt whatsoever that Prince George will become B.C.'s Edmonton, both in size and importance. As Edmonton is Alberta's gateway to the north, Prince George is becoming B.C.'s base for the development of our rich and relatively untouched northern vastness.

"It just can't miss becoming another Edmonton," says Prince George's MLA, Howard Lloyd. "The only question is when it will happen."

This prediction by Moffat and Lloyd has been echoed by the majority of people interviewed by *ForeTalk*. "It's only a matter of time" was the confident refrain of a free-wheeling breed of people who are surrounded by a seemingly boundless wilderness.

Right now, about 85 per cent of the population depends directly and indi-

rectly on the forest economy. But that is destined to change as Prince George becomes more of a distribution and service centre and, when the time comes, a base for coal and mining development. These possibilities will all be helped by the fact that geographically, Prince George is almost in the centre of the province and has become a hub for road, air, and rail transportation.

Even now, Prince George has reached a prominence that has not been appreciated by the rest of the province. "We're probably better known outside the province than in it," says Moffat. "We've moved so fast people are not rightly aware of it."

And it has moved fast. Within the span of two decades it has been transformed from a small, frontier community into a robust and wealthy city, anchoring a forestry region that is beginning to challenge the coast as Canada's leader in forest industry production.

"A lot of people arrived in a short order," notes Lloyd, in private life a



Prince George's enthusiastic Mayor, Harold Moffat.

logging contractor who grew up in Prince George in the 1940s when it had a population of about 3,000.

At that time Prince George had wooden sidewalks and gravel streets. It was entering a period of steady growth as a centre for hundreds of small sawmills being set up in the surrounding bush. By 1956 it had a population of 15,000. Between 1961 and 1969 the population increased by more than 100 per cent, and Prince George became one of Canada's fastest growing cities. That rate levelled off to a still brisk rate of 6 per cent annually through the first half of the 1970s. It is still growing at a rate of 3.5 per cent a year, ahead of all other B.C. cities, and has at present an estimated population of 70,000.



Assistant Deputy Minister Bill Young sees it the same way. "As for the primary industry, there is one thing that is finite, and that is the timber resource. Expansion in this area looks relatively limited, as forest harvesting programs are governed by sustained yield principles. But in the area of secondary forest industry, there is a big potential."

Secondary industry is already developing in Prince George, the latest being a small company called Prince George Wood Preserving

(far left) The Prince George Pulp and Paper Ltd. complex

(left) The growth of the pulp and lumber industry has helped Prince George become a family town with a rapidly expanding youthful population

Ltd. It was started by three of seven original partners who built North Central Plywood in Prince George in 1970, a huge plant that employs 350 people. The new little plant, which employs only seven, produces preserved wood foundations for basements. They are cheaper than cement and are an ideal replacement in weather too cold to pour concrete. "We thought it was about time something of this nature came along," explains Don Flynn, one of the three partners.

Flynn is typical of the adventure-some breed of businessman who has made Prince George what it is. "We won't know for a year if we are a success or not," he says. But somehow, one gets the feeling that this enterprise, like Prince George itself, will just keep on growing. **D**

Gone, of course, are the wooden sidewalks and gravel streets. Prince George is a clean and orderly city, so modern that it is doubtful there are many buildings more than 15 years old.

Construction is going on everywhere. New subdivisions continue to spring up outside the "Bowl," the main residential and commercial precinct of the city. A new wing is being added to 362-bed Prince George Regional Hospital, and downtown a \$7 million complex covering an entire block is nearing completion. It will house a growing force of provincial government workers, as well as provide more shops and offices. Another bridge over the Nechako River, which joins the mighty Fraser right in Prince George, is being planned to help handle the increasing flow of traffic from suburbs spreading north of the Bowl.

One of the most striking things about Prince George is the youthfulness of its residents, which is one major explanation for the vitality of the place and its abounding confidence in the future. Prince George has been undergoing a baby boom, and because it has more school-age children than it can handle, its educational facilities are expanding.

If you stroll downtown and encounter anyone over 45 years old, he is likely to be a visitor. Age statistics bear this out in a startling way. In 1976, 72.5 per cent of the population was under 34, nearly half the population was under 20, and less than 5 per cent was more than 60.

Prince George has only recently become a family town. Within the last 10 years, after having had a reputation of being a wild and unstable city full of transient workers and loggers coming out of the bush to let off steam, Prince George has become a place where residents are buying houses and raising families.

Today, the city has a varied and intense recreational and social life that wasn't there 15 years ago. "I recommend this city for any young couple," says Dick Brett, past President of Spruce City Wildlife Association, the main environmental group in Prince George. "You just jump into the swing of things."

"Socially this is a terrific place," says Jim McCunn, a social worker with the Ministry of Human Resources. He adds that residents are taking more responsibility for themselves by forming organizations to take care of needs within the community.

"As far as the rowdiness of the town goes, we still have our corner of 3rd and George," says Van Scofield, Manager of the Prince George office of the Council of Forest Industries and a Montreal native who enjoys the community life of Prince George. "I don't think it is nearly as bad as it used to be, and I don't think it was nearly as bad as people made it out to be. Besides, the city has grown so much I doubt the average citizen is even aware there is a problem."

One thing the people have in common is their zest for recreation. With many lakes around, now accessible

because of improved logging roads, residents take to camping, fishing, and boating. The winter is almost welcome there, for residents take to snow and ice with a passion—cross-country and downhill skiing, snowmobiling and skating.

A drive through the pleasant subdivisions of Prince George tells a lot about the style of life in the city. Often seen parked in front of tree-encircled houses are three vehicles: a family car, a pickup truck, and a camper. Frequently snowmobiles and boats are seen sitting in the yard.

Those who have stayed in Prince George for any length of time are not likely to forget it. Bill Young, now Assistant Deputy Minister of Forests, was a district silviculturalist in Prince George from 1956 to 1959, returning as Assistant District Forester and District Forester between 1964 and 1974. In recalling his days there, Young remarks, "Probably the greatest thing about Prince George is its high degree of enthusiasm. Everyone has positive thinking towards things. It doesn't matter if you work in government, industry, or belong to a club."

"This may sound corny, but sometimes, at sundown, when I would be driving back to the city from a field trip, I would get a little pain here (pointing to his heart) — it was a feeling of pride in being part of that country."

"People there to whom I have told this story don't think it is funny at all. They say they have had the same feeling — that real pride in living in Prince George." **D**

place, the better," says Jim Rustad of Kru-tad Brothers. "I think the legislation is good, but we still have to see the regulations."

"We've had our ups and downs with the market," says John Whittier of Netherlands Overseas Ltd. "That has been a factor and will always be a factor. But, think, as a whole, because we are in a well-situated world now, we should do on power."

Whittier sees more secondary industry coming to the fore at Prince George. In due time, a particle board plant and a chipboard plant will be built in Prince George, he predicts. He says, "With the allowable cut we have in the Prince George area, there is a lot of room for expansion. We don't have to cut more wood. We can produce more products."



Sprucing up its image

by Bryan McGill

"**P**rince George throbs," remarks Mayor Harold Moffat, sitting in his office in a bustling city hall that is tucked within the shadow of Connaught Hill, a major landmark overlooking the city's core. Moffat, a blunt-talking hardware dealer who has been mayor for eight years, has no doubt whatsoever that Prince George will become B.C.'s Edmonton, both in size and importance. As Edmonton is Alberta's gateway to the north, Prince George is becoming B.C.'s base for the development of our rich and relatively untouched northern vastness.

"It just can't miss becoming another Edmonton," says Prince George's MLA, Howard Lloyd. "The only question is when it will happen."

This prediction by Moffat and Lloyd has been echoed by the majority of people interviewed by *ForestTalk*. "It's only a matter of time" was the confident refrain of a free-wheeling breed of people who are surrounded by a seemingly boundless wilderness.

Right now, about 85 per cent of the population depends directly and indi-

rectly on the forest economy. But that is destined to change as Prince George becomes more of a distribution and service centre and, when the time comes, a base for coal and mining development. These possibilities will all be helped by the fact that geographically, Prince George is almost in the centre of the province and has become a hub for road, air, and rail transportation.

Even now, Prince George has reached a prominence that has not been appreciated by the rest of the province. "We're probably better known outside the province than in it," says Moffat. "We've moved so fast people are not rightly aware of it."

And it has moved fast. Within the span of two decades it has been transformed from a small, frontier community into a robust and wealthy city anchoring a forestry region that is beginning to challenge the coast as Canada's leader in forest industry production.

"A lot of people arrived in a short order," notes Lloyd, in private life a



Prince George's enthusiastic Mayor, Harold Moffat.

logging contractor who grew up in Prince George in the 1940s when it had a population of about 3,000.

At that time Prince George had wooden sidewalks and gravel streets. It was entering a period of steady growth as a centre for hundreds of small sawmills being set up in the surrounding bush. By 1956 it had a population of 15,000. Between 1961 and 1969 the population increased by more than 100 per cent, and Prince George became one of Canada's fastest growing cities. That rate levelled off to a still brisk rate of 6 per cent annually through the first half of the 1970s. It is still growing at a rate of 3.5 per cent a year, ahead of all other B.C. cities, and has at present an estimated population of 70,000.



Assistant Deputy Minister Bill Young sees it the same way. As for the primary industry, there is one thing that is true, and that is the timber resource. Expansion in this area looks relatively limited, as forest harvesting programs are governed by sustained yield principles. But in the rest of the secondary sector industry, there is a big potential.

Secondary industry is already developing in Prince George, the latest being a small company called Prince George Wood Processing.

It was started by three or seven original partners, who built North Central Forest in Prince George in 1971, a pulp plant that employs 200 people.

The very little capital investment employed only a few physical processes and foundations for the business. They are cheaper than the government's model of equipment and facilities, which is part of the problem.

"We think it is something like something in this nature," says Young, "explains the three partners."

Young is typical of the adventure-somebody's doing and smart in the field. Prince George, what it is. "We want to know, but it's not the same," he says. "But some people see it. The thing is that the enterprise has to be able to do it and not keep on growing."

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Gone, of course, are the wooden sidewalks and gravel streets. Prince George is a clean and orderly city, so modern that it is doubtful there are many buildings more than 15 years old.

Construction is going on everywhere. New subdivisions continue to spring up outside the "Bowl," the main residential and commercial precinct of the city. A new wing is being added to 382-bed Prince George Regional Hospital, and downtown a \$7 million complex covering an entire block is nearing completion. It will house a growing force of provincial government workers, as well as provide more shops and offices. Another bridge over the Nechako River, which joins the mighty Fraser right in Prince George, is being planned to help handle the increasing flow of traffic from suburbs spreading north of the Bowl.

One of the most striking things about Prince George is the youthfulness of its residents, which is one major explanation for the vitality of the place and its abounding confidence in the future. Prince George has been undergoing a baby boom, and because it has more school-age children than it can handle, its educational facilities are expanding.

If you stroll downtown and encounter anyone over 45 years old, he is likely to be a visitor. Age statistics bear this out in a startling way. In 1976, 72.5 per cent of the population was under 34, nearly half the population was under 20, and less than 5 per cent was more than 60.

Prince George has only recently become a family town. Within the last 10 years, after having had a reputation of being a wild and unstable city full of transient workers and loggers coming out of the bush to let off steam, Prince George has become a place where residents are buying houses and raising families.

Today, the city has a varied and intense recreational and social life that wasn't there 15 years ago. "I recommend this city for any young couple," says Dick Brett, past President of Spruce City Wildlife Association, the main environmental group in Prince George. "You just jump into the swing of things."

"Socially this is a terrific place," says Jim McCunn, a social worker with the Ministry of Human Resources. He adds that residents are taking more responsibility for themselves by forming organizations to take care of needs within the community.

"As far as the rowdiness of the town goes, we still have our corner of 3rd and George," says Van Scottfield, Manager of the Prince George office of the Council of Forest Industries and a Montreal native who enjoys the community life of Prince George. "I don't think it is nearly as bad as it used to be, and I don't think it was nearly as bad as people made it out to be. Besides, the city has grown so much I doubt the average citizen is even aware there is a problem."

One thing the people have in common is their zest for recreation. With many lakes around, now accessible

because of improved logging roads, residents take to camping, fishing, and boating. The winter is almost welcome there, for residents take to snow and ice with a passion—cross-country and downhill skiing, snowmobiling and skating.

A drive through the pleasant subdivisions of Prince George tells a lot about the style of life in the city. Often seen parked in front of tree-encircled houses are three vehicles: a family car, a pickup truck, and a camper. Frequently snowmobiles and boats are seen sitting in the yard.

Those who have stayed in Prince George for any length of time are not likely to forget it. Bill Young, now Assistant Deputy Minister of Forests, was a district silviculturalist in Prince George from 1956 to 1959, returning as Assistant District Forester and District Forester between 1964 and 1974. In recalling his days there, Young remarks, "Probably the greatest thing about Prince George is its high degree of enthusiasm. Everyone has positive thinking towards things. It doesn't matter if you work in government, industry, or belong to a club."

"This may sound corny, but sometimes, at sundown, when I would be driving back to the city from a field trip, I would get a little pain here (pointing to his heart) — it was a feeling of pride in being part of that country."

"People there to whom I have told this story don't think it is funny at all. They say they have had the same feeling — that real pride in living in Prince George." □

COLLECTIONS

Edited by Michael Gregson



Birling

The sport of birling seems simple enough. All you need is a log, a place to float the log, and someone to climb aboard the other end. But that's where the simple part ends. As anyone who has tried birling knows, it is hard enough to stand upright on a short, narrow log, let alone try to dump the person at the other end.

But this competitive sport, carried out on artificial ponds at country fairs and logging festivals, evolved from a very basic survival skill. Birling originated with the old river drives, and the word used to refer to riding a log down a river. In those early days, a logger's ability to ride a log down a river was a matter of life and death — if he couldn't ride a log he would either drown, boots and all, or be crushed among the hundreds of logs rushing downstream.

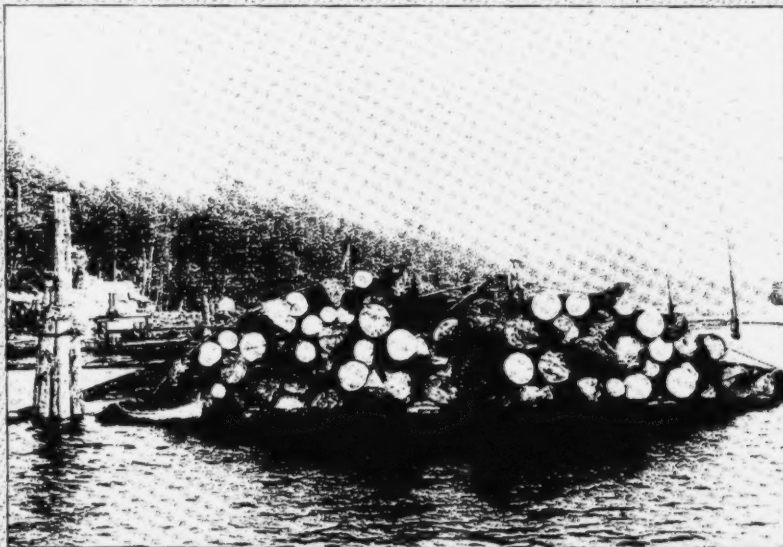
Today, the expert log birlers are more likely to be crushed among the crowds that gather to watch the old skill in action. The entertainment is provided in the fancy footwork needed to outsmart and sink the opponent. The experts make it look as easy as dancing, and the well-known record for birling is three hours.

Reaching for the Tops

The Australian mountain ash, a form of eucalyptus tree, is the world's tallest non-coniferous tree. At one time, the mountain ash was thought to overtop the California redwood. Careful measurement was required to determine that the redwood is indeed the tallest of all the world's trees.

Shady Acres

If you're thinking of a shade tree for your garden, how about a *Ficus benghalensis*, commonly known as the Banyan tree? After all, any tree which can keep the sun off 2,000 people at one time (a tree that big exists in India) will surely meet your needs. And it grows in a very convenient way, too. Starting from a single stem, the branches grow out horizontally, then root themselves in the ground to make new trunks. The result is an interior resembling a many-pillared hall. Since the crown can reach up to 100 feet, there's plenty of room to attach partitions and walls to the trunks. In fact, making a walled temple out of the Banyan was what the ancient Polynesians used to do.



Ocean-Going Rafts

During the first half of this century, some of the world's biggest objects afloat were the log rafts of the Pacific Coast.

Ocean-going log rafts were the solution to the problem of transporting unusually large timber from areas largely inaccessible except by water. These rafts were notable not only for their size, but also for their great strength — a very important factor considering the treacherous Pacific storms.

For short hauls, flat rafts were used, but for more dangerous ocean conditions and long distance transportation, a "cradle" type raft was designed. Here, logs were laid singly or in bundles on a tightly chained mat of logs.

The kings of the ocean-going rafts in both size and strength were the Benson

and Davis rafts. Both of these were able to transport millions of feet of timber. The Benson raft, invented by the American, Simon Benson, was the length of some of the largest ships of its day, including the ocean liner *Queen Elizabeth*. This raft was cigar-shaped and used up to 160 tons of chain to bind it together.

The Benson raft was eventually replaced in B.C. by the Davis raft, invented in 1913 by Bill Davis of Port Renfrew on the west coast of Vancouver Island. Even stronger than the Benson, the Davis raft was square in shape. Bundled, rather than single logs were stacked on the mat in such a way that neither cradle nor chains were required. Up to 800 feet long, only one-third of it — 16 feet — showed above water.

Woods Words

Over the past century, hard working lumbermen not only opened up the Pacific Northwest to industry and settlement, but they also pioneered a whole new way of speaking. Loggers' lingo of the past was colourful and inventive, and although most of the old terms have since disappeared — along with the old hand tools — the spirit of these words words is about as unchanging as the smell of sawdust.

Think back to the old days of logging, and consider yourself a new man on the job . . .

When you're told to "roll your blanket," what situation are you in? Translated, it means, "you're fired." But in any case, you might already have decided that the "Big Tyee" (the boss) wears a "number seventeen collar and number two hat" (lots of guts, no brains) and that the whole situation is really "school's out" (going badly) as far as the "contract" (a deal the boss and everybody else complains about) is concerned.

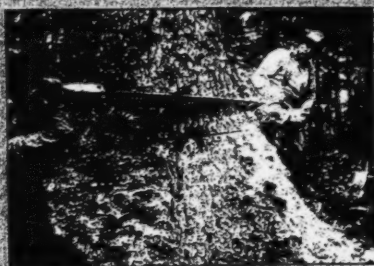
On the other hand, the Big Tyee might have decided that the only equipment you know how to handle on the job is a "presumscope" (same as a "guesstimator") and that your "monthly insult" (pay cheque) is pretty good, considering what a "shoemaker" (poor logger) you turned out to be.

—adapted from *Woods Words* by
Walter F. McCulloch, Oregon Historical Society,
Corvallis, Oregon.

In the Pink

When British army surgeon, Dr. J. B. Siegert, concocted Angostura Bitters in Venezuela in 1824, he was not thinking about making a lasting contribution to one of our more famous cocktails, Pink Gin. (Of course, he already knew that gin itself was flavoured by the crushed berries of the juniper tree.) Angostura Bitters, which bartenders now add to gin to give it a pinkish colour and mildly bittersweet taste, was originally intended for medicinal use.

The chief ingredient of Angostura Bitters is the substance angosturin, derived from the dried bark of the small, straight-stemmed Angostura tree of South America. Angosturin was used by the natives as a purgative and a stimulant. They even used it to stun fish. Angosturin, at one time, was also used by European doctors as a substitute for quinine in combating fever.



The Power Saw

Despite rapid technological advancement in most areas of the forest industry, that primitive implement, the crosscut saw, has only recently been replaced by the power saw as the woodcutter's essential tool. In fact, it is believed that hand-fallers continued to operate in B.C. as late as the early 1950s.

That is not to say that efforts had not been made to replace the crosscut saw before then, but the evolution of the power saw was surprisingly slow.

The first power saws appeared in the Pacific Northwest around 1905. They were awkward machines, driven by steam, electricity or gas, and they were heavy. These experimental designs achieved acceptance among fallers only in the form of drag saws for bucking.

The development of efficient gasoline engines in the 1940s made the power saw more useful to fallers, but the tool was still disliked. It was bulky, weighing over 200 pounds, and it required two operators to haul it through the woods and support it during a cutting operation.

The modern one-man power saw was finally developed by the 1950s. Although heavier than those in use today, this was the first power saw to be nearly as portable as the old crosscut saw. With the power saw's portability and great speed of cutting, the felling of trees in B.C. was revolutionized.

CONTRIBUTIONS?

Do you know any interesting facts about forests? Don't hold them back. Collections deals with anything from machinery to forest products and uses, from unusual facts and interesting people to forest legends. We invite you to contribute. Mail submissions to:

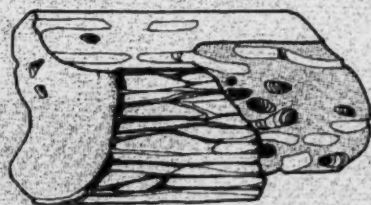
ForesTalk—Collections, Information Services, Ministry of Forests, 1450 Government St., Victoria, B.C. V8W 3E7

Information should be brief, accurate, and sources included where possible.

A Perch In A Tree

The next time you hear the expression, "like a fish out of water," consider the *Anabus Scandens*. Found in India and Southeast Asia, this ten-inch perch-like fish cannot only move awkwardly along land, but it is also known as a climber of trees. Rough scales on its body allow it to grip the tree bark, and it sometimes ascends to considerable heights.

No one seems to know why this fish would want to climb a tree in the first place. In some cases it is believed that predatory birds, such as crows and kites, carry it to the higher branches, where they perch a perch on a perch.



Holy Teredo

The cool Pacific coastal waters are home to an organism which literally eats away at the forest industry. Logs riddled with the pencil-width holes chewed out by this wood eater are a common sight along British Columbia's beaches.

The culprit is the shipworm, or "teredo," and it makes its home in wood which sits in salt water for any length of time.

The teredo is not really a worm at all, but a bivalve mollusc, like clams and oysters. Attached to its long (up to one metre) worm-like body is a small set of shells which it uses as rasping tools for burrowing into the wood. The teredo not only bores through wood (usually along the grain,) but it also leaves behind a calcium deposit which quickly makes the wood commercially useless. A log can be completely destroyed within two years.

An ancient enemy of wooden ships, today, the teredo is a major headache to forest companies which boom logs in salt water. The only defence against the destructive teredo is to leave the wood in the salt chuck for the shortest possible time.

People

Tom Brooks

by L.S. Grant

*He's soft-spoken and friendly.
But he's no stranger to trouble.
And he doesn't always agree
with the establishment.*



He's been a beachcomber on and off since 1948, so he has a pretty good idea of where to look for the good logs.

"You get to know after a while. You keep track of the tides, and you get to know what river currents can do. I've seen logs heading out of the bay at five knots. The time of day's important; you want to go out after the tugs stop working. Of course, they never admit to losing logs. But most loose sawlogs come from booms. And that's what we pick up."

Tom Brooks works out of the government wharf at Cowichan Bay on the east coast of Vancouver Island. He moved his wife and four children to the bay seven years ago from Victoria, where he was born. Old-timers there still recall Tom's father, Rocky, who wowed the crowds with feats of strength. A professional wrestler and showman, Rocky Brooks once climbed a ladder carrying a piano — with Tom's mother perched on top for the ride. He pulled buses with his teeth and blew up tire tubes with his own breath until they burst.

Rocky's flamboyance does not rest easily on Tom, who speaks quietly of himself. But the toughness is there.

Tom does what he does on his strong right leg. He lost the left one November 1, 1954, near Everett, Washington, where Highway 2 crosses a swamp on a four-mile trestle. A 17-year-old ran a stop sign, and the two collided. Tom spent four hours dangling from the trestle in the cab of a truck before they got him free. There's no trace of bitterness as he tells the story. And if the loss of a leg has slowed him up in any way, it's very hard to see.

For the last two years he's been a familiar sight to the hotshots, the pleasure boaters, the fishermen, and the tugboaters of Cowichan Bay. With his wife, Anne, or Tom Jr. aboard, Tom takes the 30-foot *Edna E.* out for

a fifteen or sixteen-hour day, depending on tides and daylight. They get 10 to 30 logs every time, but it's hard work.

The logs are 16 to 40 feet long, and they can weigh several tons each. Thus, in the rough water, the little *Edna B.* may be dodging a five-ton monster that rises four or five feet with the swells and is impossible to control. Anne leans over the side with a small sledgehammer to drive the dog — the steel tow-ring — into the heaving log. Then they quickly play out some line and gun the engine to get some distance between the log and the *Edna B.*

Not all logs are in deep water. A beachcomber does comb beaches, wearing hipwaders in this case, and with his boat as close to shore as possible. "We've beached her a few times," says Tom. "Nothing serious." But the *Edna B.* still finds herself in the shipwright's way from time to time, nursing a bent shaft or twisted rudder.

Beachcombers are licensed under the 1970 Log Salvage Regulation of the B.C. Forest Act. Licences are issued to people, rather than to boats. Tom, Anne, and Tom Jr. are all licensed, and the big L.S. 2668 seen on the *Edna B.* is Tom's number. Anne Brooks goes out by herself occasionally, but never when Cowichan Bay's famous sou'easters are blowing. "I don't particularly care for the eight-foot swells," she says. But she recently learned to come about in heavy seas without taking a wave into the wheelhouse — no mean accomplishment.

The Brooks spend most of their time outside the Bay in Sansum Narrows and around Saltspring Island. They boom their logs in Antone Bay, then haul them to a licensed receiving station in Ladysmith or Victoria. Each log may bring "anything from two dollars to two hundred," according to scale and grade. But Tom is not entirely happy with the scaling and grading system.

"I got interested in picking up deadheads," he says. "There are lots of them around. They holed or sank eight or ten boats in the Narrows last year. I found a market for them. It's all covered in the Regulation. But when I wrote the Ministry in Vancouver to double-check, I got back a letter saying they'd have to be scaled in the water. How do you scale a 30-foot log in the water? With skin divers?" He shakes his head. "I gave up the whole idea."



It's not the only time Tom has found himself at odds with the government. This July, they tore down his house. It stood on pilings on the Cowichan Bay foreshore, looking out at the towboats and booms of the estuary. An appropriate spot for a beachcomber — but unfortunately, too far into the highway allowance. The house had to come down to make room for a wider road. With the moving deadline already past, and their roof already partly dismantled, Tom and Anne Brooks sipped their morning coffee, unruffled, as they waited for word on their next home. "Things used to upset me," says Anne. "Not anymore."

How does Tom feel about the TV series *The Beachcombers*?

"That poor guy's been towing that log for a year," he laughs. "Guess he'll make it one of these days. But the show has encouraged some people to try the trade. There used to be all kinds of hot-rod boats around here with big V-8s. I used to have one myself, but with all that power there was a race for every log. And they burn too much fuel to stay out very long. They're okay if there's a spill — then you just run out, grab a bunch of logs, and run back."

"But the *Edna B.*, who's pushing 50, can stay out all day. And she's still faster than most of the salvage boats around here. She just looks slow because she doesn't throw any water. I raced a guy home the other day with everybody laying bets. We spent the whole afternoon at the Bluenose with the winnings."

The *Edna B.* like Tom Brooks, has had a checkered career. Built in 1929, she was operated by MacMillan Bloedel until 1965. Since then she has seen eight owners and a short spell at the bottom of the Fraser. Hauled out, scraped down, painted, and refitted, she looks ready to run at the word of a spill.

Close calls? Sea stories? Tom may not encounter an adventure a week like the TV beachcomber, but there is enough excitement to keep him interested.

"Coming down from Campbell River once, I noticed the bilge pump running non-stop. There was three feet of water in the bilge. I started wondering if I should beach her on Hornby Island. Then it got dark and started to blow behind me. I got Anne on the phone somehow — she'd been looking for me because I was late — and I decided to make a run for Lasqueti Island."

"As I got near the dock, she radioed again. There was a scuttled airplane near the dock. Between the bilge, the storm, the darkness, and the seaplane, it wasn't easy, but I finally got in and tied up. Next thing we heard, there was a tug coming in with a scow to pull out the plane. The tug captain was loaded — absolutely loaded — and he was bearin' down full bore with no room to stop. I ran out and hollered at him with the bull horn. He missed the plane, all right. But he banged into me."

"So, we sat there for a couple of days, and finally I figured we better get moving. I pulled out into the channel and took a wave that broke four feet over the wheelhouse. We thought it over and decided Lasqueti Island was a pretty nice place to spend a little time."

Another day slipped by at Cowichan Bay, and the Brooks were still waiting for their next home. Tom woke up to find that the house was without power. A crow had flown into the transformer across the street.

Tom looked up at the pole and sighed. It was going to be one of those years. **B**

Letters to the Editor

Criticism From Creston

I have been reading *ForesTalk* with great interest for many issues. However, the Spring 1978 issue is just too much.

You suggest that your magazine is designed to encourage interest, discussion and understanding of B.C.'s Forest resource. Reading the letters to the editor I often see the term, "informative magazine." I read articles concerning the growth of forests, the progressive management of forests, improved utilization, etc. — all progressive terms. Why is it I don't see anything about the negative aspects of our forest industry — the mismanagement, terrible waste, and mistakes of the past that are not being rectified in the present?

You must realize that the majority of your readers are from cities and towns and seldom get back into the "harvesting" areas or into the mills that "utilize" our forest resources. Few people can be bothered digging through the muck to begin to understand the politics and economics of our forest industry, and how it affects our economic system, mental and social values, and how it will affect our future.

Your article, "A Perspective on Forest Policy" (*ForesTalk*, Spring 1978) makes it sound as though Ray Williston (Minister of Lands, Forests and Water Resources, 1956-1972), "staid firm" and forced inefficient, wasteful, inferior mills into "efficient" close utilization, and to "use every scrap of timber possible or be refused timber rights." In reality, timber companies were offered a 33 per cent increase in quotas, as well as third hand timber, if they would comply with close utilization — an increase of 90 to 110 per cent to comply. In our area, I believe, close utilization has resulted in more waste, and it is the policy that led directly to our present shortage of mature timber.

I am sorry, but I believe your magazine is propaganda. I believe it is designed to encourage complacency, not interest, frivolous rhetoric, not informed discussion, and to discourage understanding of B.C.'s very real forest problems.

Ralph Moore
Chairman, Public Advisory Committee
to the Forest Service
Creston P.S.Y.U.
Creston, B.C.

ForesTalk attempts to provide our readers with a wide range of information on B.C.'s forest and range resources.

Articles such as "A Perspective On

Forest Policy" present a general overview of the development of forest management policy in the province. That these policies must be updated to respond to the changing complexion of the province's timber supply and to the growing demands placed on the forest and range resources by both the forest industry and the public is made clear in the province's new forest and range legislation (see "A Perspective On Forest Policy, Part II," and "Intensive Forest Management: Its Time Has Come," in *ForesTalk*, Summer 1978).

ForesTalk tries to report on this important issue as objectively as possible. We also invite readers to express their views on this or any other topic pertaining to B.C.'s forest and range resources.

Editor

Covering The Spectrum

We are a citizens' group interested in all aspects of resource management. *ForesTalk* is a valuable information source in this regard. Please enter us on your mailing list to receive *ForesTalk* on a regular basis. Thank you for your help.

J. Bryant
Energy Group
Penticton, B.C.

The Scales Of History

I was especially interested in the Spring 1978 issue of *ForesTalk* with the picture of A.L. Bryant on the cover, as he was my uncle.

Mr. Bryant scaled beams for my father at Scotch Fir Point 72 years ago.

F. Fraser McRae
Scotch Fir Point Road
Powell River

A Hive Of Interest

Would you please send me (additional) copies of *ForesTalk*, Summer 1978?

The article on wasps, "The Original Paper Makers," is one I must share with my young friends — without parting with my precious copy (We have a nest in the yard!).

Thank you again for a most interesting and informative magazine.

M.A. Decorbey
Campbell River, B.C.

Letters to the editor provide an opportunity for our readers to discuss topics arising out of *ForesTalk*. Letters for publication must carry the reader's name and address. Vandalism and libel are not necessarily endorsed editorially. *ForesTalk* reserves the right to edit for publication.

A STICKY BUSINESS

Some *ForesTalk* subscribers will not have received their summer issue of *ForesTalk*. The reason: a number of magazines lost their address labels while travelling through the mail system.

The problem of labels not sticking properly was noticed early in the mailing process, and many copies of *ForesTalk* had their labels secured with tape prior to mailing. Also, various regional post offices kindly taped down as many wayward labels as they could.

Unfortunately, we have no way of knowing which subscribers did or did not receive a copy of *ForesTalk*.

We apologize for this inconvenience and we will send out copies of the summer issue to anyone requesting them for as long as the supply lasts.

The problem of labels coming unstuck is, we believe, now solved, and we don't expect a repeat of such an unfortunate occurrence in the future.

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Attach label HERE for change of address. If you receive duplicate copies, please send both labels. Please list new address below.

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The CROWS of the Forest

by Enid K. Lemon



This baby northwestern crow will grow into a smaller, but look-alike version of the common crow. The common crow resides in all parts of B.C. except the coastal areas, where the northwestern crow takes its place. In spite of their negative characteristics - including a habit of robbing nests - crows definitely have a positive side. They recycle our garbage, devour harmful insects, and give the alarm for all birds whenever predators appear.

From the gregarious gray jay, who is only too happy to join humans at the picnic table, to that mysterious loner, the raven, British Columbia's forests are home to seven different members of the crow family (*Corvidae*). There are over 100 different crow species around the world, and despite some of their unappealing habits they are considered by many to have the highest IQ in the bird world. The five other species found in B.C. are the magpie, Clark's nutcracker, Stellar's jay, the northwestern crow, and, of course, the common crow.

If you start your crow-watching at the edge of the dry forest in the unique Osoyoos area in the southern interior, where a tongue of the Sonora Desert actually extends into B.C., the black-billed magpie will be easy to spot. A slow flyer, this striking black and white bird stands out against the pale landscape. The widely spaced Ponderosa pines comprise the magpie's forest habitat, but its feeding habits take it to roads and farms where it cleans up carrion and makes welcome inroads on the grasshopper population. Like others in the crow family, it robs nests of eggs and young birds.

The magpie and its life-long mate build unique dome nests of sagebrush and poplar sticks. The nest can have more than one entrance, and it is often built layer upon layer for several seasons. This can result in nests as high as four feet.

The British have a superstition regarding magpies. They were considered in folklore to be a bird of ill omen. "One for sorrow, two for mirth," the saying begins. Even in modern times many people are uncomfortable if they spot a single magpie and fail to see another shortly afterwards.

The gray jay, until recently, was known as the Canada jay. This name is perhaps more appropriate — there is not a lumber camp or mining operation in the woods of Canada that does not have its quota of gray jays. This audacious bird's habits and love of carrion have

resulted in a number of nicknames, including meat bird, grease bird, venison hawk, whiskey jack, and camp robber.

The gray jay's generic name *Pertoreus* comes from the Greek meaning "I heap up". And indeed it does — storing pellets of meat and fat amongst the conifer needles. Without such an activity this bird would not survive the sub-zero weather in which it builds its nest and raises its young. In March, with the snow at its deepest, the gray jay builds a bulky nest of sticks and leaves, lining it with fine grasses, deer hair, and grouse feathers. This soft, warm lining is made exactly to fit the bird's body, thus reducing heat loss during incubation. It is not uncommon for a gray jay to incubate with snow on its back.

Clark's nutcracker, one of the more handsome members of the crow family, was named after Captain William Clark of the famous Lewis and Clark Expedition of the early 1800s. A bird of the mountains and sub-alpine forest, it spends its entire life between 3,000 and 12,000 feet. It is no stranger to camps and picnic grounds where it will beg, borrow, or steal anything it spies, but it has a preference for the seeds of the Ponderosa pine. It has a special cheek pouch located under its tongue, enabling it to hold extra seeds or nuts in addition to those in its beak.

Steller's jay bears the name of George Wilhelm Steller, a German naturalist. Steller was a member of the Russian expedition to Alaska in 1740. Owing to sickness among the crew, their leader, Bering, would only allow Steller a few hours ashore on Kayak Island. Steller collected all he could as fast as he could, and one of his specimens was a previously unidentified jay.

Although more shy than its cousins, Steller's jay will visit camps, farms, and even suburban backyards. Lower Vancouver Island experiences an occasional influx of these sleek-crested birds when they come to gorge on the acorns of the garry oak.

B.C. is host to two species of actual crows — the common crow and its look-alike, but slightly smaller cousin, the northwestern crow. The common crow resides



(top) The striking black and white colouration of the magpie makes it stand out against the landscape. Its feeding habits take it to roads and farms where it cleans up carrion and makes welcome inroads on the grasshopper population.

(above) The gray jay (formerly the Canada jay) is a common sight among lumber camps. Sometimes called the venison hawk or whiskey jack, among other names, this audacious bird has a special love for carrion.

(centre) Clark's nutcracker is a bird of mountains and sub-alpine forests. It has a special cheek pouch located under its tongue, enabling it to hold extra seeds or nuts in addition to those in its beak.





throughout most of the province, except for the coastal areas. Here, the northwestern crow takes its place.

These two species have few friends among humans. Awkward, homely, and noisy, they are considered "fair game" at any time. However, Henry Ward Beecher, the nineteenth century American preacher, remarked: "If men wore feathers and wings, very few could be clever enough to be crows!"



In spite of their negative characteristics — including a habit of robbing nests — crows definitely have a positive side. They recycle our garbage, devour many harmful insects, and give the alarm for all birds whenever predators such as hawks or owls appear. Although their nest robbing seems cruel in our eyes, it is one of those necessary checks and balances of nature.

It is a pity that crows, who have been clever enough to survive under drastically changing environmental conditions, have lent their name to a number of derogatory savings. Perhaps the most common expression, "to eat crow," arose from an incident which occurred during the War of 1812. An American who was out hunting unwittingly crossed the British lines and shot a crow. Apprehended by a British officer, the offender was relieved of his firearm (for crossing the lines, not for shooting a crow) and was forced to bite off and eat a portion of the crow. When the hunter's gun was given back to him, he turned it on the officer and compelled him to eat the remainder of the bird!



(top) The awkward, homely and noisy common crow has few friends among humans, but, as Henry Ward Beecher said, "If men wore feathers and wings, very few could be clever enough to be crows!"

(left) Although more shy than its cousins, Steller's jay will visit camps, farms, and even suburban backyards. Lower Vancouver Island experiences an occasional influx of these sleek-crested birds when they come to gorge on the acorns of the garry oak.

The raven, the largest and perhaps the most fascinating member of the crow family, deserves special attention. This bird will be treated separately in a future article in the Forest Habitat Series. **U**



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HONOURABLE TOM WATERLAND, MINISTER